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ABSTRACT

Theory on parenting styles was used as a theoretical framework to examine the relationship of aspects of school climate to the mathematics achievement, academic engagement, and locus of control orientation of eighth graders. Student and school data were drawn from the National Educational Longitudinal Study of 1988 for 19,435 students and 997 schools. Hierarchical linear modeling techniques were used to examine the relationship between students' and administrators' perceptions of school climate and students' achievement, engagement, and control orientation. With students' individual background characteristics as well as aggregated socioeconomic status of the schools controlled, authoritarian school climates were associated with lower academic engagement and control perceptions for eighth graders, as well as more differentiating effects of prior grades on their mathematics achievement, a greater gender gap in academic engagement, and increased differentiating of students' socioeconomic status on their mathematics achievement and perceptions of control. Authoritative schools, on the other hand, were not associated with either beneficial or detrimental outcomes for students; however, this component was created from administrators' reports that were less predictive of student outcomes than were students' report. Findings for authoritarian schools are comparable to results documented in the parenting styles literature. Implications for policy and practice are discussed, as are suggestions for further research. Three appendixes contain factor loadings and item descriptors from the principal components analysis, a description of variables used in the analysis, and a description of the hierarchical models used in the analysis. (Contains 6 tables and 57 references.) (Author/SLD)

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Reconceptualizing the Debate on School Climate and Students' Academic Motivation and Achievement: A Multilevel Analysis

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Paper presented at the annual meeting of the American Educational Research Association, New Orleans, April 2000.

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Abstract

Theory on parenting styles was used as a theoretical framework to examine the relationship of aspects of school climate to eighth grade students' mathematics achievement, academic engagement, and locus of control orientation. Authoritarian school climates were hypothesized to relate to declines in students' engagement, perceptions of control, and mathematics achievement. Conversely, authoritative school climates were hypothesized to be associated with more beneficial outcomes for students, particularly their perceptions of control and academic engagement. Student and school data were drawn from the National Educational Longitudinal Study of 1988 and consisted of 19,435 students and 997 schools. Hierarchical linear modeling techniques were used to examine the relationship between students' and administrators' perceptions of school climate and students' achievement, engagement, and control orientations. With individual students' background characteristics as well as aggregated socioeconomic status of the schools controlled, authoritarian school climates were associated with lower academic engagement and control perceptions for eighth graders, as well as more differentiating effects of prior grades on their mathematics achievement, a greater gender gap in academic engagement, and increased differentiating effects of students' socioeconomic status on their mathematics achievement and perceptions of control. Authoritative schools, on the other hand, were not associated with either beneficial or detrimental outcomes for students; however, this component was created from administrators' reports that were less predictive of student outcomes than were students' reports. Findings for authoritarian schools are comparable to results documented in the parenting styles literature. Implications for policy and practice are discussed as are suggestions for further research.

School reform in the United States is a topic of continual public interest. Recent debate over whether public schools are in a state of crisis and warrant private intervention (Berliner & Biddle, 1995) has greatly heightened the public's awareness of the need for school improvement, especially when our schools are compared to those in other countries (Stigler & Perry, 1990). Responding to the perceived problem with public schooling, the United States governmental systems, from federal down to local school boards, have sought to find cost effective ways of improving schools, particularly to make public schools look better in comparison to schools in other districts, states, and especially, other countries. One way that has been gaining popularity is the standards-based movement to increase accountability in our nation's public schools (U.S. Department of Education, 1999). Although these efforts are well-intentioned, one has to question whether the increasing drive to test our students, grade our schools and teachers with report cards that are printed in the local paper (Dunkelberger & Dolan, 1999) and otherwise increase top-down control of schools is going to dramatically improve schooling in America. As federal control of schooling increases, one wonders whether there are general school climate factors that should be taken into consideration besides just trying to improve individual students' achievement, particularly in middle schools where there is evidence of sharp declines in not only student achievement, but also in psychosocial outcomes such as intrinsic motivation and engagement in learning (Eccles, Lord, & Buchanan, 1996; Harter, 1992; Midgley & Edelin, 1998; Wigfield, Eccles, & Rodriguez, 1998).

There have been a number of recent attempts to reform middle schools through a variety of restructuring practices (Carnegie Council on Adolescent Development, 1989; George & Alexander, 1993); however, such attempts focus on examining specific practices, such as team teaching (Mac Iver & Epstein, 1991), rather than trying to conceptualize the nature of the

problem and then engage in hypothesis testing to determine if there is empirical support for the theory. At the other end of the spectrum are several theoretical explanations for students' disengagement and decreased achievement in middle school, with concomitant research that provides some support for the theories, but which fail to adequately capture the breadth of the problem. Rather, researchers tend to focus on one concept as the root of the difficulty, whether that be the lack of community in schools (Schaps, Battistich, & Salomon, 1997), the excessive bureaucratization of schooling (Lee, Bryk, & Smith, 1993), or the need for greater academic press and rigor, particularly in economically disadvantaged schools (Shouse, 1996). Although such issues are important, they conceptualize schools in terms of specific practices or unidimensional constructs, rather than more sophisticated explanations that aim to get at the complex nature of the schooling process. Phillips (1998), for example, investigated whether communitarian schools or rigorous schools were better predictors of student achievement and attendance. Although she found that schools with a greater emphasis on academic press tended to have improved outcomes in achievement and attendance, there is reason to be concerned with her analysis. First, other studies have demonstrated consistent, positive benefits of a communal organization on outcomes such as performance, achievement, engagement, interest, and intrinsic motivation (Battistich, Solomon, Kim, Watson, & Schaps, 1995; Lee & Smith, 1993). Second, although Phillips noted some methodological problems with previous analyses of communitarian climate, she did not include affective or motivational factors[1], such as student attitudes towards school, as outcomes in her analysis. On the other hand, Phillips and Shouse each have documented the strength of association between academic press and individual student achievement. Achievement will remain the benchmark of student success for quite some time. The issue is whether it will be the only benchmark of student success in public schools. Thus, the

debate about the relative advantages of communitarian environment versus bureaucratic climate may become subsumed in debates about how to increase the academic press orientation of particular schools. Increasing standards for students, teachers, and schools (U.S. Department of Education, 1999) is certainly more in line with notions of academic press than with those of communitarian climate. The disadvantages of this position are that students' psychosocial and motivational outcomes may be ignored in favor of a narrow focus on increasing achievement. Although Shouse (1996) recognized that communal schools and high academic standards need not be mutually exclusive, framing the debate in terms of this dichotomy creates an either-or tension inherent in the historical background of the debate between advocates of these two differing conceptions, as Shouse documented in his review of the literature. Our point is that if we want both community and rigor, then we need a term that conveys this dual focus.

A different way to conceptualize the problem, one that includes a synthesis of both constructs, was presented in a theoretical paper by McCaslin and Good (1992). These authors suggested that the construct of authoritative schooling, originating with the work on parenting styles pioneered by Baumrind (1971), holds great potential for denoting the type of school to which our nation should aspire. Authoritative schools, like authoritative parenting, contain the best aspect of communitarian schools without losing the rigor inherent in notions such as academic press. By emphasizing both responsiveness to students' needs as well as student accountability to standards, the notion of authoritative leadership promotes a view of schooling that meets students' needs for both increasing autonomy and control as well as intellectual challenge, in an atmosphere with clear, well-defined rules and limits. Additionally, it may prevent the proliferation of the view of schools as feel-good places where self-esteem is

bolstered at the cost of decreasing achievement and commitment to learning (McCaslin & Good, 1992).

Background

Middle School Climate and Adolescent Outcomes

The Carnegie Commission (1989), echoing the claims of theorists such as Eccles (Eccles, 1993; Eccles et al., 1996), Midgley (Midgley & Edelin, 1998), and their colleagues (Wigfield et al., 1998), suggested that the mismatch between the organization of middle schools and the intellectual and emotional needs of young adolescents may be one reason behind documented declines in adolescents' achievement and engagement upon the transition to middle grade schools from elementary schools. Environment-stage mismatch is thought to be caused by adolescents' developmental needs for autonomy increasing right at the time that schools are becoming more bureaucratic and less responsive to students' needs (Eccles et al., 1996). Therefore, certain researchers advocated that schools should become increasingly autonomy-supportive, with an emphasis on promoting feelings of self-efficacy and relatedness, in order to promote positive outcomes in students, such as self-regulation and engagement in learning (Connell & Wellborn, 1991), rather than remaining controlling, bureaucratic organizations. The middle school movement (George & Alexander, 1993) publicized this theme, calling for increased teaming and responsive practices in order to counteract the more bureaucratic, unfriendly organization of junior high schools.

Research on communitarian school climate is flourishing (Brown, 1994; Lee & Smith, 1993; Schaps et al., 1997). Battistich and his colleagues (1995) found moderate to strong positive effects of communal organization (measured by students' perceptions of supportive relationships among students and faculty as well as degree of student autonomy) on students' enjoyment of

class, liking for school, intrinsic academic motivation, trust in teachers, reading comprehension, conflict resolution skills, prosocial motivation, and altruistic behavior. Similarly, Lee and Smith (1993) found that middle schools that embraced restructuring practices, such as schools within a school, untracked classes, team teaching, nondepartmentalized structure, methods similar to those advocated by supporters of the middle school movement (George & Alexander, 1993), were associated with somewhat higher student engagement and achievement. Both of these views suggest that aspects of school climate related to increasing responsiveness to students' needs and greater closeness of the entire school population are important factors contributing to student engagement in learning. This perspective was echoed by the Carnegie Commission's (1989) recommendation for transforming schools into "small communities for learning where stable, close, mutually respectful relationships with adults and peers are considered fundamental for intellectual development and personal growth" (p. 9, emphasis in original).

Others would take a different perspective. According to Shouse (1996), even though there may be beneficial outcomes associated with communitarian climate, the goal of schooling is still achievement, and both Phillips (1997) and Shouse find stronger relationships between academic press and academic achievement than between communitarian climate and academic achievement. Even more importantly, Shouse found that in economically disadvantaged schools, a strong sense of community combined with low academic press was particularly deleterious for students, and he suggested that such schools may be dysfunctionally communal. Phillips' results replicate Shouse's—on average, increased amounts of teachers' caring in schools is related to lower average student test scores. Midgely and Edelin's (1998) claim that not only do adolescents need greater autonomy and connection to others during the middle school years but also need cognitive challenge may be used to situate such findings in the framework of

environment-stage theory. Nevertheless, all the aforementioned studies, including the present one, are correlational; thus, claims of causal direction cannot be made from these analyses. Perhaps teachers at low-achieving schools try to bolster students' confidence by pouring on warmth and caring to buffer their students from the negative effects of their low achievement. Such a claim is strengthened by studies that report higher levels of self-esteem in African-American students (Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994), a group more vulnerable to social consequences of racism and prejudice and their concomitant effects—lower socioeconomic status and decreased job opportunities for instance—compared to all other ethnic groups in the United States.

McCaslin and Good (1992), in their often cited article, warned of the risks of the proliferation of authoritarian schools that seek to reduce student autonomy. In the current climate of reform, where problem solving, self-motivation, self-regulation, and teamwork are recognized as desirable workplace skills and outcomes of education, schools that are authoritarian in nature (controlling without being responsive to students' needs for autonomy) will never be able to foster such qualities due to the inherent contradiction between these two competing goals. This strong critique suggests that it is not enough to call on schools to increase their academic press without at the same time demanding that they become more responsive to students as well.

Research on motivation suggests that, at least in Western countries, autonomy-support in classrooms benefits students in ways that may not be directly related to immediate academic achievement, but rather inculcates desirable long-term dispositional outcomes in students. For example, Boggiano (1998) found that students who perceived their classrooms as autonomy-supporting tended to have an intrinsic as opposed to extrinsic approach to learning. The benefits of intrinsic motivation have been widely reported (Ames, 1992; Blumenfeld, 1992; Connell &

Wellborn, 1991; Cordova & Lepper, 1996; Deci, Ryan, & Williams, 1996; Lepper, Sethi, Diadlin, & Drake, 1997; Middleton, 1995; Ryan, Sheldon, Kasser, & Deci, 1996; Sansone & Harackiewicz, 1996) and will not be discussed here, but studies that document relationships between classroom climate and intrinsic desire to learn are worthy of serious consideration.

In addition to autonomy, there is evidence that perceived control is likewise related to student engagement in learning (Connell & Wellborn, 1991; Patrick et al., 1993). Beliefs about whether one's academic performance is due more to luck or ability rather than to effort represent an external locus of control orientation. Similarly, the opposite holds true: students who believe that their achievement reflects personal effort have an internal locus of control orientation. The study by Patrick and his colleagues provides empirical support for the combined, yet distinct, influence of perceived control and autonomy on children's motivation and engagement in learning. They concluded:

> Optimal motivation, then, characterized by active behavioral involvement, interest, enthusiasm, and happiness, is the result of both perceived control centered on the effectiveness of effort and reasons for engagement that are autonomous. (p. 789, emphasis in original)

According to Connell and Wellborn (1991), schools can and should provide autonomy support and structure to enhance students' and teachers' sense of self-determination and internal locus of control. In addition, they recommended that schools promote student and teacher involvement to enhance relatedness, a third hypothesized psychological need. Interestingly, these psychologists' calls for reform are being echoed by social theorists and other educational reformers. McNeil (1986), in her insightful ethnographic investigation of high school social studies classes, proposed that the following pattern was associated with authoritarian school

structures: Administrators' control over most aspects of their schools reduced teachers' power over their classroom. Teachers' resentment at losing control of their classrooms resulted in their reducing the cognitive complexity of their subject matter. Students then resisted this dumbing-down of the curriculum by viewing school knowledge as unreal and unconnected to their lives, hence disengaging from learning except for accumulating the necessary requirements in order to earn a degree. Similarly, in a study by Anderman and Midgley (1997), the transition from fifth grade in an elementary school to sixth grade in a middle school was associated with students' embracing performance goals versus task goals, greater emphasis on relative ability, as well as with declining student perceptions of their academic competence. Therefore, motivational consequences must not be neglected when studying the relationship of school climate to student outcomes. Lee et al. (1993), reaching a similar conclusion as that proposed by McCaslin and Good (1992), voiced the general claim of this paper when they stated:

> While we support a movement away from what we see as the current overbureaucratization of American secondary schooling, some words of caution are in order. Any embrace of a vision of school as a community (or "small society") must be integrated with a view of the school as a formal organization that seeks to rationally, effectively, and efficiently promote student learning. The point is that while each perspective [communitarian schools and those that emphasize academics] illuminates distinctive features of effective schools and would lead us to different reform emphases, neither is sufficient. Rather, it is only by giving serious attention to both perspectives that the true depths of effective schooling can be discerned. (p. 229)

Parenting Styles

We have suggested that research on parenting styles, in the tradition of Baumrind (1971, 1991) and her colleagues, is a useful way to frame the debate about school climate so that both rigor and responsiveness are seen as equally necessary to the establishment of effective schooling practices that result in desirable academic, motivational, and social outcomes for all students, but particularly middle schoolers in their vulnerability to the effects of school transition. Next, we will briefly review the literature on the socializing influence of parenting style and its relation to young children's development in order to be able to extend this discussion to schools and their socializing influences.

Baumrind (1971) has examined the relation between two orthogonal dimensions of parental authority and behavior: the degree of responsiveness and the degree of demandingness or control exhibited by parents with their young children. Three parenting styles were of interest. Authoritarian parents were high in demandingness and low in responsiveness. Permissive parents were low in control, but relatively responsive to their children. Authoritative parents scored highly on both dimensions. It is this latter category that is often considered the ideal parenting style for Western cultures because it is associated with numerous positive cognitive and social outcomes for children, including self-reliance, self-control, high achievement for girls, and greater social responsibility among boys, among other benefits. Authoritarian parenting, on the other hand, was associated with children's discontent, withdrawal, and distrust, and permissive parenting yielded mixed results based on the child's sex, including less social responsibility in sons when compared to authoritative parenting and less independence for daughters.

Research on parenting style continues to flourish, with most researchers currently using the 4 style typology based on Maccoby and Martin's (1983) revision of Baumrind's original

research. In this updated version, permissive parenting is subdivided into indulgent (warm and not demanding) and neglectful (neither warm nor demanding) styles. Recent research continues to find significant relationships between authoritative parenting practices and children's well being. For adolescents, outcomes associated with this parenting style include greater psychosocial competence and self-reliance, or perceptions of internal control (Lamborn, Mounts, Steinberg, & Dornbusch, 1991); greater intrinsic motivation (Leung & Kwan, 1998); and higher achievement for English-speaking students (Leung, Lau, & Lam, 1998). Adolescents' adjustment was associated with an authoritative parenting style maintained over the course of year in the longitudinal study conducted by Steinberg and his colleagues (1994). In preschool children, authoritative parenting was related to greater cognitive competence, greater independence for girls, and a greater sense of social responsibility in boys.

Authoritarian parenting, on the other hand, was associated with greater obedience and conformity but lower academic self-concepts in adolescents (Lamborn et al., 1991). In addition, controlling parents were related to both extrinsic motivation and amotivation in their adolescents (Leung & Kwan, 1998). Cross-culturally, authoritarian parenting was more problematic for European-American students and somewhat more advantageous for Asian-American students with regard to grade point average and self-concept (K. Leung et al., 1998; Steinberg et al., 1994). In studies of Western preschoolers, authoritarian parents had children who demonstrated less social competence than their peers, greater withdrawal behaviors, a more external moral system, lower academic motivation, lower self-esteem, and an external locus of control orientation (Maccoby & Martin, 1983).

Neglectful parenting, on the whole, was the most deleterious parenting style of all, being associated with greater psychological and behavioral dysfunction, consequences that worsened

over time (Steinberg et al., 1994). Conversely, adolescents from indulgent homes had strong self-concepts, but they were also more likely to be involved in illicit drug use and to be disengaged from school (Lamborn et al., 1991). The overall conclusion of these studies as a whole was well stated by Baumrind (1991): "In sum, adolescents' developmental progress is held back by directive, officious, or unengaged practices and facilitated by reciprocal, balanced interaction characteristic of both Authoritative and Democratic [more responsive than demanding] parents" (p. 753).

Clearly, for children raised in the United States, authoritative parenting serves as a model for the type of parenting that may lead to better outcomes for children and adolescents. Although the aforementioned studies were correlational, and the reciprocal effects of students' temperament interacting with parenting style cannot be ruled out, according to Steinberg et al. (1994), their use of a longitudinal design that controlled for initial group differences provided indirect evidence that parenting practices precede and contribute to adolescent behaviors and adjustment. Because schools serve as socializing agents (schools are said to function in loco parentis) in addition to parents' efforts to raise children, interesting questions for research are whether general school climate can be characterized along similar continuums of demandingness and warmth and then whether combinations of these dimensions are associated with similar outcomes in students, controlling for individual differences among students. Such research may help to clarify the debate over the type of school environment that reform efforts should endeavor to inculcate in schools. Indeed, authoritative schooling may be the ideal environment for schools to emulate, just as McCaslin and Good (1992) have hypothesized. First, however, it is important to ascertain whether school climate variables do cluster together in patterns similar to those characterized by research on parenting style. Then, these factors would have to relate to

student outcomes in patterns similar to those found in the parenting literature in order to provide initial support for the validity of this reconceptualization of school climate.

Purpose of Study

Although several researchers have advocated for schooling practices that are both rigorous and responsive (Lee et al., 1993; McCaslin & Good, 1995), there has been little empirical research examining school climates based on this theoretical perspective, particularly on how such climates relate to both academic and motivational outcomes in students in a large sample. The purpose of this study was, first, to conduct a principal components analysis to determine if school climate variables obtained from a large national data base would cluster together along lines related to those documented in the parenting styles literature. Second, to examine the relation between identifiable aspects of school climate and their relation to middle school students' achievement and motivational outcomes. Not only were we interested in predicting differences between schools on each of the outcomes, but also in accounting for variation within schools due to individual differences. Additionally, we wanted to control for students' background characteristics, such as gender, socioeconomic status, minority status, and academic background, in order to make up for the correlational nature of this study to some extent. Unlike Shouse (1996) and Phillips (1997), we included motivational outcomes, such as academic engagement and locus of control orientation, in addition to achievement. Locus of control is a specific motivational variable afforded by the NELS:88 data set for analysis, and it relates to the previously discussed correlation between authoritarian parenting and increased external locus of control orientation (Maccoby & Martin, 1983). Finally, we were particularly interested in analyzing whether these outcomes were associated with opposing patterns in authoritarian schooling climates versus authoritative ones.

The first hypothesis tested was whether school climate variables cluster together in a pattern related to research on parenting styles. If we found that this indeed was the case, our next hypothesis was related to Baumrind's (1971) claim that there are two qualitatively different aspects of controlling those less powerful than you; the key lies in the difference between firm and restrictive control. Someone using firm control is consistent and authoritative, but is still fair, warm, and responsive to children's needs. Believers in restrictive control are more concerned with maintaining authority and silencing potential acts of rebellion than with listening to those less powerful than they are. Therefore, our second hypothesis was that authoritarian school environments would show the opposite pattern of relationships when compared to authoritative environments, specifically (a) authoritarian school climates would be related to a variety of detrimental student outcomes, particularly less engagement in learning, a more external locus of control orientation, lower mathematics achievement, and increased differentiating effects with regard to gender, socioeconomic status, minority status, and academic background; (b) authoritative climates would be associated with more beneficial outcomes for students, particularly in stronger internal locus of control orientation, greater engagement, and higher mathematics achievement, as well as less differentiation between gender, socioeconomic status, minority status, and academic background and the outcomes under investigation (i.e., more equitable schools). Finally, noting that schools' social class composition strongly predicts average student mathematics achievement (Lee & Bryk, 1989; Lee et al., 1993), we hypothesized that school climate effects would be greater for engagement and locus of control orientation than for achievement, when the relative economic advantage of the middle schools included in this study was controlled.

Method

Data and Samples

Student and school data were compiled from the base year of the National Educational Longitudinal Study of 1988 (NELS:88), a national survey of eighth-grade students, school administrators, teachers, and parents of selected students sponsored by the National Center for Educational Statistics (NCES). The NCES used two-stage stratified sampling, with oversampling of underrepresented schools and students, to select schools, and then to select 25 eighth graders on average within these schools for the base year (Ingels, Abraham, Spencer, & Frankel, 1990). The total sample consists of 24,599 students in 1,052 schools. The population of interest for the present study are eighth graders enrolled in public or private schools in the United States.

Base year data were collected in 1988 through the use of questionnaires administered to students, their principals, parents, and some of their teachers. For the purposes of the present study, only student and principal responses in the base year were analyzed. Additionally, because data from both students and their administrators were needed in order to conduct the hierarchical analyses, students and schools with missing data were not included in the analyses, reducing the student sample size to 19,435 and the school sample size to 997.

Due to NCES oversampling of students and schools in NELS:88, all analyses were weighted.[2] The base year design weight (BYQWT) was used to calculate descriptive statistics of student-level variables, whereas the administrator weight (BYADMWT) was applied to the aggregated school-level data. In order to correctly weight the level-1 and level-2 analyses in HLM, a base year student weight was calculated by dividing the design weight by the administrator weight to use in the level-1 analyses (Ralph Lee—NCES, personal communication, June 10, 1998). The administrator weight was retained for the level-2 analyses.

Measures

Items from the student and administrator questionnaires were used to create individual and composite measures of student and school-level predictors and student outcome variables. Four measures were created using principal components analysis: the outcome variable academic engagement as well as three school-level predictors of school climate (student perception of school climate and two administrator perceptions of school climate). See Appendix A for factor loadings and for the individual NELS:88 items that comprise each component. Principal components weighted and standardized (mean = 0, sd =1) scores were used in the analyses of each of these four composite variables. Descriptions of all measures and reliability coefficients for the composite measures are presented in Appendix B.

Outcomes

Three outcome variables were investigated in this study. Math achievement was measured by students' scores on a standardized, 40-item, 30-minute test of eighth-grade students' general mathematical knowledge. Locus of control was a NELS:88 composite of items that reflect the degree to which students have a sense of personal agency and perceive themselves as internally controlled rather than as passive victims of circumstances or luck. Academic engagement, a researcher-created composite of items that reflect students' interest in and preparedness for school learning, is similar to the engagement composite formed by Lee and Smith (1993) except that the present study included skipping classes instead of hours spent on homework because the latter was hypothesized to relate more to parental and social capital factors rather than to academic engagement.

Student-Level Predictors

Previous research has demonstrated support for controlling for individual students' socioeconomic status, gender, minority status, and academic background when investigating the relation of achievement to school-level predictors (Battistich et al., 1995; Lee & Smith, 1993). Each these variables, labeled SES, Gender (Females = 1), Minority Status (Minority students = 1), Prior Grades respectively, were included as a means of both holding relevant individual differences constant as well as to model variation in their slopes in the between-school analyses that were conducted. The relation between students' general academic background information and their academic motivation was thought to be relevant; therefore this variable (Prior Grades), rather than prior mathematics grades, was included in the analysis. The latter would have been a suitable control if mathematics achievement was the only outcome of interest.

School-Level Predictors

Schools in poor neighborhoods generally have fewer resources than schools in wealthier neighborhoods, and the communities in which poor students live may be less supportive of education. In order to reduce the likelihood that school climate effects[3] would be spurious relationships caused by social advantage, students' SES was aggregated to the school level (MeanSES) and controlled in the school-level equations.

The primary predictors of interest in this study were school climate variables that were hypothesized to cluster in patterns related to research on parenting styles (Baumrind, 1971; Maccoby & Martin, 1983). For student perceptions of school climate, base year NELS:88 school climate items from the student questionnaire were examined using SAS to conduct a principal components analysis on the seven items [4] listed in Appendix B. One component emerged from the analysis; it will be termed Unresponsiveness and reflects the degree to which students view

schools as negative, unfair, unresponsive institutions. Higher scores on this component reflect a more authoritarian climate according to students' perceptions.

Principal components was conducted on 13 items taken from the school questionnaire completed by the school principal or his or her designated representative. A two-component solution was selected according to the scree criterion and was rotated obliquely using a Harris-Kaiser rotation. These components (see Appendix A for details) were labeled Rigor and Conflictiveness and are correlated, $r = -.32$. The first component represents the degree to which administrators perceive their schools to be demanding institutions with well-established discipline procedures, structured—rather than loose or informal—organization, high expectations for homework, and low tolerance for deviation from school rules. High scores on this component reflect a commitment to structured and rigorous education for students; however, this does not mean the schools are unresponsive to students. Rather, in line with the concept of authoritative schooling, rigorous schools are also responsive schools. Teachers encourage students to do their best, they respond to student needs, and teacher morale is high. The second component, Conflictiveness, represents the degree to which administrators perceive their school to be negative, conflictive places for students. It is positively correlated with the student climate component, Unresponsiveness, $r = .27$. Conflictive schools are places where teachers, students, and administrators do not get along. Furthermore, they are places with low teacher morale and an unresponsive attitude toward student needs. Higher scores on this component reflect a more authoritarian environment from the administrator's perspective.

Analysis

Descriptive statistics and correlations were calculated using the appropriate weights as discussed previously. Because the focus of this study was on the relationship between school

climate variables and individual student outcomes, the data were multilevel and nested within schools. Multilevel modeling provides an appropriate means of analyzing nested data;[5] in addition, it allows the researcher to investigate cross-level interactions between within-school slopes and school-level predictors (Bryk & Raudenbush, 1992). Hierarchical linear modeling (HLM) was thus used in all subsequent analyses to examine the relation of the school-level and student-level predictors to adjusted mean outcomes as well as to the distributive effects on the level-1 slopes. HLM provides a means of examining heterogeneity of regression by modeling separate regression equations for each distributive effect. Preliminary analyses were conducted through a random effects ANOVA and random coefficients model to determine the proportion of variance due to the level-1 predictors as well as to estimate their regression coefficients. Multivariate likelihood-ratio tests between the random coefficients model and one in which the slopes were specified as fixed were conducted to determine if any of the level-1 slopes should be specified as random (Bryk & Raudenbush, 1992). Then, full between-school models were specified for each outcome and examined for nonsignificant predictors. Final HLM models were created that reflect models that are hypothesized to reflect the association between level-1 and level-2 variables and the outcomes of interest. Due to the use of grand-mean centering in the within-school equations, the final HLM model is similar to a multilevel ANCOVA[6] analysis in which the characteristics of individual students are controlled when examining the adjusted means. In addition to examining the relationships to adjusted means, because factors that attenuate inequitable differentiating effects of students' demographic characteristics are worthy of research and theoretical consideration (Bryk & Raudenbush, 1992), relationships on within-school slopes were likewise examined. Technical details for each stage of the hierarchical analysis can be found in Appendix C.

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Results

Descriptive Analyses

Descriptive statistics for all of the variables used in the analyses, weighted for oversampling and nonresponses, are presented in Table 1. Fifty-one percent of the eighth-grade students sampled were female, and 22% were either Black, Hispanic, or Native American. The average score for students' grades from sixth grade through the time of the questionnaire administration was 2.97, just below a B (3.0).

Correlations between the variables per type are reported in Table 2. All correlations were significant because of the large sample size. In order to ensure that the dependent variables were measuring distinct constructs, it is important that these variables were not highly correlated. The highest correlation, between academic engagement and locus of control, was $r = .29$, accounting for only 8% of the variance between these two outcomes; therefore, the analysis proceeded with each of the three outcomes treated as distinct constructs. Among student-level controls, the highest correlations were quite moderate, $r = .32$ and -.32, for the relationship between SES and Prior Grades and minority status respectively. More advantaged socioeconomic status was related to better grades in the past two grade levels for these students. Additionally, minority students had lower socioeconomic status compared to White and Asian students. Correlations among school-level predictors were likewise low. The highest associations were between administrators' perceptions of conflictiveness and mean SES ($r = -.31$), between conflictiveness and rigor ($r = -.32$), and between conflictiveness and students' perceptions of unresponsiveness ($r = .27$). The pattern of correlations supports the construct validity of the measures. Furthermore, schools that were more socially advantaged were less likely to have conflictive or negative climates, yet they were more likely to be demanding than less advantaged schools.

Preliminary HLM Analyses

Results for random effect ANOVAs are presented in Table 3 for each outcome variable. The results show that schools account for a larger proportion of achievement variance (.25) than engagement (.07) or locus of control variance (.06). Similarly, the reliability of the school means is larger for achievement (.75) than for academic engagement (.45) or locus of control (.44). As a result, it may be more difficult to demonstrate effects on the latter two variables. Nevertheless, all variance components were significant [$\chi^2(996) = 9351.807$, $p = .000$ for math achievement; $\chi^2(996) = 2252.882$, $p = .000$ for engagement; $\chi^2(996) = 2235.073$, $p = .000$ for locus of control orientation]. Because there are significant differences among the schools on each of that achievement, engagement, and locus of control there may be significant school characteristics that influence these variables.

Within-School Analyses

The next step was to examine a model that included only student-level covariates and predictors. The purpose of this stage of the analysis was to (a) estimate the average school adjusted means and slopes for each outcome variable; (b) determine whether there was significant variation among these slopes and means across schools; and (c) estimate the correlations among the intercepts and slopes (Bryk & Raudenbush, 1992). Table 4 presents the results of these random coefficients models for each outcome variable. All continuous independent variables (SES and Prior Grades) were standardized to a mean of 0 and standard deviation of 1; hence HLM coefficients represent an effect size measure[7].

Math Achievement. A multiparameter hypothesis test indicated significant between-school variation in the slopes,[8] $\chi^2(14) = 676.012$, $p = .000$; thus all level-1 slopes were treated as

random in the level-2 equations. Appendix C contains the equations for each model that was analyzed. The average SES-math achievement and Prior Grades-math achievement slopes were both significant; the standardized regression coefficient was larger for students' previous grades ($\beta = .47$). Minority students, on average, were 1/3 of a standard deviation behind their nonminority peers in mathematics achievement. Additionally, female students lagged significantly behind their male counterparts in eighth-grade scores on the standardized math assessment.

There was highly significant variation among schools in average adjusted mathematics achievement [$\chi^2(690) = 2248.27$, $p = .000$]. Furthermore, there were differences among schools in the relationship between mathematics achievement and gender [$\chi^2(690) = 988.72$]; minority status [$\chi^2(690) = 915.65$]; SES [$\chi^2(690) = 1084.73$]; and prior grades [$\chi^2(690) = 1221.59$, $p = .000$ for each]. Finally, an R^2-type statistic can be calculated from the student-level variances in the model and the unconditional model to give a sense of the proportion of variance accounted for by these student-level covariates. In the typical school, thirty-nine percent of the variance in mathematics achievement among the students was associated with these four student-level predictors.

Correlations between adjusted mean math achievement and the school-specific slopes are presented in the second panel of Table 4. Schools with high adjusted mean achievement tended to have larger SES ($r = .27$) and prior grade ($r = .47$) slopes. In other words, high-achieving schools also tended to have large differentiating effects for SES and prior grades. On the other hand, these schools were associated with narrower minority gaps ($r = -.19$) and gender gaps ($r = -.11$) in mathematics achievement. Other notable correlations include the moderate, positive association between the minority gap and SES-achievement slope ($r = .37$)—suggesting that

schools with large minority gaps in achievement were also schools with greater differentiating effects of SES on mathematics achievement—as well as the negative association between the gender gap and the minority gap ($r = -.30$). This latter relationship means that schools with greater achievement differences between males and females had smaller achievement differences between minority and white students.

Academic Engagement. As with mathematics achievement, the hypothesis that the slopes between academic engagement and the level-1 covariates did not vary randomly was rejected, $\chi^2(14) = 607.4$, $p = .000$; therefore, all level-1 slopes were treated as random in the school-level equations. Next, the individual hypotheses—that averaged across schools, there were relationships between particular student-level variables and academic engagement—were tested. Results are likewise presented in Table 4. Students' prior grades was the strongest predictor of academic engagement ($\beta = .32$). On average, students with better academic grade reports are more likely to be engaged in school, or, in other words, to report being prepared for class, not skipping classes, and not being bored in school. The only other significant predictor of academic engagement was gender: Girls were more likely than boys to report greater engagement in schooling.

Schools varied significantly in their adjusted mean academic engagement [χ^2 (690) = 1339.40, $p = .000$) as well as in all of the slopes between each level-1 covariate and academic engagement, χ^2 (690) = 1150.87 for the engagement-gender slope; χ^2 (690) = 1040.23 for the engagement-minority status slope; χ^2 (690) = 989.69 for the engagement-SES slope; and χ^2 (690) = 1224.09 for the engagement-prior grades slope, $p = .000$ for each. Additionally, 19% of the variance in individual students' academic engagement was associated with gender, minority status, SES, and prior grades.

Correlations between the slopes and the adjusted mean are presented in the third panel of Table 4. Schools with higher adjusted mean engagement tended to have smaller differentiating effects of prior grades on engagement (r = -.25) and smaller gender gaps (r = -.30) in academic engagement. Similarly, schools with smaller gender gaps in engagement were tended to have larger minority gaps in engagement (r = -.35). On the other hand, there was a positive association between the minority gap in engagement and differentiating effects of SES (r = .20) and prior grades (r = .21) on academic engagement.

Locus of Control Orientation. As in the previous two analyses, a reduced model that specified slopes as fixed was rejected by a test of the multiparameter deviance statistic, $\chi^2(14)$ = 430.818, and all level-1 slopes were treated as random in subsequent analyses. There were significant relationships between prior grades (β = .31), SES (β = .10), gender (β = -.13) and locus of control orientation averaged across schools. As in the previous analyses, there was significant variation in adjusted mean locus of control orientation between schools, χ^2 (690) = 1027.67, p = .000) as well as in all the level-1 slopes, χ^2 (690) = 967.67 for the control-gender slope; χ^2 (690) = 905.36 for the control-minority status slope; χ^2 (690) = 909.41 for the control-SES slope; and χ^2 (690) = 1005.34 for the control-prior grades slope, p =.000 for each. Finally, 14% of the variation in students' locus of control orientation was due to these four covariates.

Correlations between the average slopes and adjusted mean are reported in the final panel of Table 4. Higher adjusted mean internal locus of control orientation was related to smaller relationships between SES (r = -.23) and minority status (r = -.26) with locus of control. Larger SES-locus of control slopes were related to larger minority gaps (r = .58) in locus of control orientation as well to weaker relationships between prior grades (r = -.35) and locus of control.

Between-School Analyses

In these analyses, the relationships of adjusted means[9] and within-school slopes to school-level predictors were investigated. Results are presented in Table 5 and explained in further detail for each outcome variable separately. Note that all results, except for the intercepts, were standardized by dividing the HLM estimates by the adjusted school-level standard deviations reported in Table 6. Based on the results of the previous within-schools analysis, all slopes were allowed to vary randomly across schools. For each outcome variable—mathematics achievement, academic engagement, and locus of control orientation—the variance components for the random effects of all adjusted means and slopes were highly significant ($p = .000$); thus, the means and slopes were left as random in the final analyses. Technical details of these analyses are presented in Appendix C.

Math Achievement. The average social class of a school was the only significant predictor of students' adjusted mean math achievement. Adjusted mean achievement was higher in schools with higher mean SES ($\beta = .66$). Neither school climate nor school social class predicted the gender gap or minority gap in achievement. The relationship between SES and achievement was stronger in advantaged schools and in schools administrators perceived as conflictive.

The proportion of variance in adjusted mean mathematics achievement accounted for by all four school-level predictors was 24%. For the gender gap, as would be expected from the nonsignificant predictors, only 2% of the variance was accounted for by this model; however, 7% of the variance in the minority gap, 20% of the variance in the SES-achievement slopes, and 27% of the variance in the prior grades-achievement slope were accounted for by this model. Although average school social class was a stronger predictor of the achievement outcomes than

most of the school climate variables, for the SES-achievement relationship, 19.3% of the variance was due uniquely to the three school climate predictors,[10] and only .3% was due to mean SES.

Academic Engagement. Contrary to the results for mathematics achievement, average school social class did not predict adjusted mean engagement in learning; rather, the school climate variables were the significant predictors of this outcome. Adjusted average engagement was lower in schools perceived as unresponsive by students ($\beta = -.65$). Students' self-report of engagement in school tended to be higher in schools perceived by administrators as conflictive ($\beta = .12$). The gender gap in academic engagement was predicted by average school social class and students' perception of schools as unresponsive. The sizes of these relationships were equal but in the opposite direction. Smaller gender gaps ($\beta = -.21$) tended to occur in more advantaged schools; on the other hand, larger gaps in engagement ($\beta = .21$) between eighth-grade girls and boys tended to occur in more unresponsive schools. The minority gap was only predicted by school social class—more advantaged schools had, unfortunately, greater disparity between minority and White and Asian students in academic engagement. The final relationship of significance again involved schools perceived by students as unresponsive to their needs; such schools tended to have steeper prior grades/engagement slopes.

The proportion of variance in adjusted mean academic engagement associated with the school-level predictors was 20%. Between 6–7% of the variance in the gender gap, minority gap, and SES-engagement slope were likewise accounted for by these predictors; however, they accounted for only 2.5% of the variance in the prior grades-engagement slope. Of these relationships, the school climate variables were substantially stronger predictors than was mean

SES with regard to adjusted mean achievement (19%), the minority gap (6%), and the SES-engagement slope (5.9%).

Locus of Control Orientation. Schools perceived as unresponsive was the strongest predictor of adjusted mean locus of control orientation, being associated with a half of a standard deviation decrease in students' adjusted mean control. Conversely, increases in school social class were commensurate with increases in students' sense of control ($\beta = .36$). Differences between boys and girls in locus of control orientation were greater in advantaged schools ($\beta = .26$). Further, in advantaged schools students' prior grades were more strongly related to their control orientation ($\beta = .23$); on the other hand, their socioeconomic status was less likely to be related to their locus of control orientation ($\beta = -.18$) in more advantaged schools. Finally, the relationship between students' socioeconomic status and their sense of control was stronger in conflictive schools ($\beta = .23$).

Seventeen percent of the variance in adjusted mean locus of control orientation was associated with the four school-level predictors. Between 2–3% of the variance in the gender gap, minority gap, and prior grades-locus of control slope, but 8.4% of the variance in the SES-locus of control slope, was associated with mean SES, unresponsiveness, rigor, and conflictiveness as a whole. Of these percentages, the three school climate variables were uniquely associated with 11% of the variance in adjusted mean locus of control and 5% of the variance in the SES-locus of control slope.

Summary and Results of Hypothesis Testing

The first hypothesis concerned whether school climate variables cluster together in dimensions similar to those found in the research on parenting styles. From the principal

components analysis of student and school NELS:88 school climate items, there was evidence that such dimensions do indeed exist. Unresponsive schools and conflictive schools (the students' and administrators' respective perspectives on the degree of authoritarian climate at their schools) were positively correlated, and both were negatively correlated with rigorous schools (administrators' perceptions of a more authoritative climate). In addition, authoritarian schools were associated with more negative outcomes for students in general. On the other hand, rigorous schools, although reliably measured, were not significantly associated with any outcome, thus calling into question the validity of this measure of authoritativeness. In general, the administrators' perceptions of school climate demonstrated weaker relations to student outcomes than did student perceptions.

The second hypothesis, that authoritarian school environments would show the opposite pattern of associations with student outcomes than that displayed by authoritative environments, was somewhat supported. Unresponsive schools and rigorous schools were each differently related to student outcomes; however, because rigorous schools were not significantly related to any outcome, this hypothesis cannot be fully supported by the present study.

The hypotheses that followed from the second claim concern the specific direction of the obtained associations, with authoritarian climates hypothesized to relate to detrimental student outcomes and authoritative environments to more beneficial outcomes for students. There was significant variance between schools on each outcome measure, and the school climate variables accounted for some degree of that variance. Authoritarian school environments, as measured by students' perceptions of their schools' lack of warmth and responsiveness, were associated with lower students' mean perceptions of control and academic engagement controlling for individual differences between students as well as with greater differentiating effects of prior grades on

achievement and a larger gap between boys and girls in engagement than were schools with authoritative environments. In addition, conflictive school climates were related to larger differentiating effects of students' socioeconomic status on their mathematics achievement and perceptions of control. Thus, this hypothesis was for the most part supported, except for the slight increase in adjusted mean engagement associated with conflictive schools. This relationship was smaller than any of the other previously discussed relations, however; thus the majority of evidence favors this hypothesis. The next hypothesis, that authoritative environments—as operationalized by the component, rigorous schools—would be related to better outcomes for students, was neither supported nor rejected by the data obtained in this study. Administrators' perceptions of climate were, in general, associated with very few outcomes, and none of these associations were obtained from entering rigorous schools as a predictor of between school variance in student outcomes. The final hypothesis, that school climate effects would be greater for engagement and locus of control than for mathematics achievement once school social class was controlled, was supported.

Discussion

Overall, this study provides evidence that schools perceived as authoritarian by students—those where teachers are unresponsive to students, unfair discipline exists, and poor school spirit reigns—tended to have students with lower academic engagement and perceptions of control, even when individual differences, such as minority status, gender, socioeconomic status, between students were controlled. In addition, several inequitable differentiating effects of student demographic characteristics were augmented in authoritarian schools, such as the tendency for boys to be less engaged in school and for students with higher previous grades to be more engaged in school. In schools perceived as conflictive by administrators, the tendency for

students with higher socioeconomic status to have higher achievement and internal locus of control orientation is likewise of concern. Furthermore, some of these relationships were as large as, or larger, than the relationships obtained with school social class as a predictor. This suggests that, unlike the claims of Phillips (1997) or Shouse (1996), the general degree of school responsiveness to student needs is an important aspect of school climate, at least with regard to students' motivation, and thus this study supports the research on communitarian school environments (Battistich et al., 1995; Lee & Smith, 1993). Furthermore, in their recent study, Reeve, Bolt, and Cai (1999) identified autonomy-supporting behaviors as those that were associated with the degree and nature of teachers' responsiveness to students' questions, concerns, and needs, adding further evidence in support of responsiveness as an important component of desirable school and classroom environments.

Besides the finding of empirical relationships between unresponsive schools and students' academic motivation, some of the results obtained in research on parenting styles were replicated in the present study. Congruent with Lamborn and her colleagues' (1991) findings, lowered students' perceptions of control were associated with the authoritarian style, whether of schooling or parenting. Authoritarian climate was likewise associated with lowered academic motivation in both the present study and in research on parenting style (Maccoby & Martin, 1983). Baumrind's (1991) explanation for why some parents use authoritarian practices with their teenagers echoed the schooling concerns of McCaslin and Good (1992) when she claimed that restrictive parenting practices are sometimes used by parents to forestall potential conflicts emerging from adolescents' desires for increasing independence. Moreover, in accord with researchers on school context and adolescent outcomes (Carnegie Council on Adolescent Development, 1989; Eccles et al., 1996; Simmons & Blyth, 1987), Steinberg and his colleagues

(1994) suggested that adolescents' motivational distress may be caused by being parented in a style that is "increasingly developmentally inappropriate" (p. 765). There are a number of parallel concerns between the literatures on parenting styles and school climate; this study reports findings that suggest that such concerns are not independent of each other. For the majority of students in the United States, unresponsive parenting as well as unresponsive schooling is related to detrimental outcomes with regard to students' motivation and engagement in learning.

It is important to note that academic engagement and locus of control orientation were only modestly related to each other; therefore, they each represent a different perspective on students' engagement in the classroom. Academic engagement, as operationalized in this paper, represents students' general readiness to learn and interest in their classes. Locus of control orientation, on the other hand, represents students' general strategy and capacity beliefs (Skinner, 1995). Having a high, internal sense of control is related to a variety of beneficial student outcomes, particularly active involvement in class and positive affective states (Patrick et al., 1993). Because schools perceived as unresponsive by students were related to lower engagement and perceived control, and the measure of locus of control was similar to measures used in previous research on control beliefs, there is evidence for the concurrent validity of the measure of academic engagement used in this study. Furthermore, this suggests that unresponsive schools may be related to a host of negative motivational and affective problems—not assessed in the National Educational Longitudinal Study of 1988—for middle grade students, which may account for some of the declines in middle school students' motivation and psychosocial well-being when compared to their elementary school years.

In conclusion, the associations obtained between students' motivation and control orientations, on one hand, and schools perceived as having a negative climate and restrictive relations among faculty, students, and administrators, on the other, provide support for the emerging consensus that schools function best when they are fair, yet supportive and autonomy-supporting places for children to learn (Connell & Wellborn, 1991; McCaslin & Good, 1992; McNeil, 1986). Theories of intrinsic motivation maintain that by neglecting to meet children's needs for autonomy, relatedness, and competence, schools engender disaffection rather than engagement in the learning process (Battistich et al., 1995; Connell & Wellborn, 1991; Cordova & Lepper, 1996; Deci et al., 1996). This is of particular importance when considering middle school students whose motivation for learning is at an all-time low, putting them at risk for a variety of negative outcomes, including dropping out of school (Eccles et al., 1996; Harter, Whitesell, & Kowalski, 1992; Rumberger, 1995).

This is not to suggest that schools should emphasize responsiveness at the cost of demandingness however. Although this study did not find significant relationships for authoritative schooling practices as operationalized from administrators' perspectives, there is strong evidence that demanding schools are related to increased academic achievement for all students, particularly for economically disadvantaged students (Phillips, 1997; Shouse, 1996). Furthermore, Midgley and Edelin (1998) warned that although the current trend in middle school reform has been to become more responsive by implementing a variety of restructuring practices, the academic climate of middle schools has not improved. It seems clear that neither academic press nor responsive schooling practices will be enough in themselves to foster the creation of middle schools that truly meet adolescents' emerging needs for autonomy and challenge. Rather, the construct of authoritative schools incorporates both ideas—challenge and responsiveness,

press and autonomy—to provide a vision of schooling that may optimally support adolescents' continuing cognitive and social development throughout the middle school years.

Limitations of the Study

Choosing to use a large, national database for research has its advantages and disadvantages. On the one hand, due to the large sample size, there is sufficient power to detect relationships that may exist in the population. Further, the random nature of the selection process allows us to generalize results nationally and to a diverse student population, something that local studies cannot usually afford to do. On the other hand, in order for a wide variety of researchers to make use of the data, questionnaire items are general in nature and often are not theoretically driven. This leaves the independent investigator with the task of using factor analysis and theoretical considerations to select items of relevance; unfortunately, this may result in constructs being operationalized differently than they have been in previous research. For instance, in the present study, although items relevant to academic engagement did form a single principal component, motivation researchers generally study behaviors such as persistence or choice, rather than self-reports of being bored or cutting class. Therefore, it is difficult to compare the results of this study with much of the research on students' motivation. Nevertheless, this is not always the case. Locus of control items in NELS were guided by previous research on control beliefs, and they form a composite measure of control that is comparable across other studies.

Another limitation of this study was the lack of a measure of authoritative schooling from students' perspectives. The absence of a variable comparable to Rigor in the student questionnaire leaves us unable to draw conclusions about whether authoritative schooling is related to improved outcomes for students when climate is measured from students' self-reports.

For now, we can only report the negative relationships associated with students' perceptions of authoritarian schooling practices and then infer from previous literature that positive ones may exist when both demandingness and responsiveness are embraced by middle schools.

Other weaknesses include the poor reliability of the measure of administrators' perceptions of conflictive/authoritarian environments. In addition, the reliability of the school means for academic engagement and locus of control as estimated by HLM was poor. Measurement error can obscure results that exist in the population. More importantly, a large portion of the variance between schools, particularly in adjusted mean academic engagement and locus of control orientation, remains left to be explained, even after average school social class and school climate have been controlled. Finally, it is important to reiterate that although the results have been sometimes described as effects, because the present study was correlational, it cannot provide empirical evidence of causal direction.

Implications for Policy and Practice

The major implication of this study for educational policy makers is that neither the construct of academic press nor communitarian environment on its own provides a sufficiently comprehensive vision to guide school reform efforts. Although academic press, as previously discussed, is related to higher student achievement, unresponsive schooling practices, as this study demonstrated, are related to decreased engagement and locus of control. Therefore, the concept of authoritative schooling may generate a more fruitful direction in which to steer reform efforts that promote both higher student achievement and engagement in learning. Another implication of this study is the need for stronger emphasis on encouraging positive, supportive relationships equally among teachers, administrators, and students. Unresponsive schools were places where students and teachers did not get along, but inequitable relationships were also

augmented in schools where administrators and teachers did not get along and teachers had low morale, at least according to administrators' reports. As Connell and Wellborn (1991) stated:

> If institutional structures exist that are not sensitive to teachers' and students' needs for autonomy and relatedness, competitive dynamics between the institutional goals for competent performance and individual needs for autonomy and relatedness may occur. The result would be increasing disaffection of the participants. (p. 69)

Unfortunately, with the recent national emphasis on performance standards, there is the likelihood that controls on schools will increase, just as McNeil (1986) feared in her insightful study of high schools. This study adds further empirical evidence to the research literature linking overly unresponsive, negative school climates with student disengagement in learning and an external locus of control orientation. Such evidence should be considered before implementing top-down school reforms that aim to increase control of students and teachers in order to achieve an end of greater academic achievement, possibly at the expense of students' engagement in learning and perceptions of control. To be fair, though, the current administration's school reform initiative, Goals 2000, combines both upper-level directives with a goal of funding local school districts' initiatives (U.S. Department of Education, 1999), at least in principle, and may be a model of a more locally sensitive reform process.

On a different note, even though the relation of average school social class to student outcomes was not a theoretical concern of this study—instead, it was controlled to clarify differences in schools due to climate rather than wealth—this analysis provides further empirical support to the literature on the social distribution of achievement (Lee & Bryk, 1989; Lee et al., 1993). Specifically, the degree to which a school is socially advantaged is related to higher adjusted mean mathematics achievement and internal locus of control orientation as well as to

attenuated gender gaps in academic engagement and more equitable relations between individual students' socioeconomic status and their locus of control orientation. On the other hand, socially advantaged schools tended to have greater inequitable relationships among students, particularly larger differentiating effects of students' socioeconomic status and prior grades on their mathematics achievement, larger minority gaps in engagement, and larger gender gaps in perceived control. These results may be explained by the Lee et al. (1993) claim that school social class composition is not simply a proxy for greater financial resources; rather, more socially advantaged schools are composed of students, faculty, and parents who have different beliefs and expectations than those in poorer schools. These beliefs and values have an indirect influence on organizational behavior. Because the present study does not provide evidence of causal direction, and because the relationship between greater school social advantage and student outcomes was mixed, one conclusion that should not be made is that funneling money into low-achieving schools, without attending to other issues such as school climate and parent involvement will automatically result in better student achievement and engagement. On the other hand, policies, such as school vouchers, that might encourage economically advantaged students to abandon public schools in favor of private ones may deprive such schools of the social and economic advantages that are related to better mathematics achievement and control orientation for their students.

Suggestions for Further Research

Although this study was correlational by design, by including controls for individual and school background characteristics, we are able to move closer to inferring causal relationships that may exist. Another school background characteristic that has been related to student outcomes is school size, and thus future researchers may want to examine if different outcomes

result when both size and average social class of the school are controlled at the school level of analysis. Next, because students' perceptions of school climate demonstrated better reliability and validity than administrators' perceptions, at least with regard to student outcomes, future research should include measures of students' perceptions of authoritative climate to test the hypothesis that such schools lead to more beneficial outcomes for students than do authoritarian schools. On a similar note, collecting more specific measures of students' academic engagement and general motivation than those provided by NELS:88, particularly measures related to current research on motivation such as persistence and choice of activities (Eccles, Wigfield, & Schiefele, 1998; Wigfield et al., 1998) would enable research on school climate to be integrated with the rich database of research on motivation that is currently accruing. Furthermore, even though adjusted mean standardized mathematics achievement scores were not significantly related to school climate, it would be worthwhile to determine if other measures of achievement, such as problem solving, teamwork, and creativity, would be positively associated with authoritative schooling and negatively associated with authoritarian schooling, as predicted by McCaslin and Good (1992).

In order for research on school climate to advance according to the parenting styles framework advocated in this paper, it is necessary to create a reliable measure of school climate containing items that tap both dimensions of demandingness and warmth from a student's perspective. Then the results should be factor analyzed across a large sample of students to determine if there is empirical evidence in support of a bi-dimensional measure of school climate. Another area of research that would have practical implications for schooling would be to investigate the effects of classroom climate separately from school climate to determine which is the most strongly related to desirable student outcomes. Specifically, do authoritative teachers

serve as buffering agents in overly authoritarian schools, or do such schools overpower teachers' effects on their classrooms with regard to students' general motivation and achievement? A three-level hierarchical model, with students nested in classrooms, which are then nested in schools, would be one way to analyze such data. Then, if research on school climate does support a bi-dimensional model along the lines suggested by parenting research, the next logical question to ask would be if different patterns of demandingness and warmth are related to more positive outcomes for students of differing cultures. Finally, in addition to beliefs about the degree one has control over one's environment, beliefs about one's capabilities of being able to act in certain situations—one's sense of self-efficacy—are strongly related to students' achievement and motivation to learn (Bandura, 1993; Pajares, 1996b). Given the power of domain-specific efficacy beliefs to explain a variety of students' academic and motivational problems (Pajares, 1996a; Ryan, Gheen, & Midgley, 1998), another useful study would be to explore whether classroom and school climate were related to specific efficacy beliefs.

In conclusion, the beneficial results of both academic press and communitarian environments documented in previous research combined with the negative outcomes related to unresponsive schools found in the present study should serve as a cautionary reminder that the pendulum of educational reform efforts should not swing too far in either direction. Instead, the construct of authoritative schooling reminds us to keep both demandingness and responsiveness in tension. Maintain high expectations for students within a warm environment that is responsive to students' individual differences rather than emphasize competition at the expense of community or warm fuzzies at the expense of intellectual challenge. This is a vision of schooling that has the potential to shift educational reform from simplistic, uni-dimensional efforts to a richer, dual focus on adolescents' emerging needs for both challenge and autonomy, without

sacrificing accountability. It is an old-fashioned Hegelian compromise (Vygotsky, 1978) to a current issue receiving a great deal of attention these days, and one that we think might serve to advance the debate about school climate in a fruitful direction.

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Appendix A

Principal Components Analysis: Factor Loadings and Item Descriptors

NELS:88 Item	Description	Factor Loading
	1. Student Self-Report of General Academic Engagement	
BYS78B	Comes to class without books.[1]	.77
BYS78C	Comes to class without homework.	.74
BYS78A	Comes to class without pencil/paper.	.74
BYS76	Frequency of cutting classes.[2]*	.46
BYS73	Bored in school.*	.45
	2. Student Perception of Cold, Unresponsive School Climate	
BYS59G	Teachers are interested in students.[3]	.78
BYS59F	Good teaching	.77
BYS59J	Most teachers listen to what I (the student) say.	.71
BYS59A	Students get along well with teachers.	.68
BYS59D	Discipline is fair.	.58
BYS59B	School spirit	.56
BYS59I	Feel put down by teachers in class.*	.51
	3. Administrator Perception of Rigorous and Demanding School Climate	
BYSC47J	School day is structured for students.[4]	.84
BYSC47D	Classroom is structured.	.76

NELS:88 Item	Description	Factor Loading
BYSC47B	Discipline is emphasized at this school.	.74
BYSC47F	Students are expected to do homework.	.74
BYSC47K	Deviation from school rules not tolerated.	.74
BYSC47E	Teachers encourage students to do their best.	.72
BYSC47O	Students face competition for grades.	.35
BYSC47I	Teachers have difficulty motivating students.	.18
BYSC47H	Teachers have negative attitude about students.	.08
BYSC47A	Conflict between teachers and administrators.	-.09
BYSC47L	School environment is flexible.*	-.17
BYSC47M	Teachers respond to individual needs.*	-.48
BYSC47G	Teacher morale is high.*	-.50
4. Administrator Perception of Negative, Conflictive School Environment		
BYSC47H	Teachers have negative attitude about students.	.83
BYSC47I	Teachers have difficulty motivating students.	.73
BYSC47A	Conflict between teachers and administrators.	.54
BYSC47M	Teachers respond to individual needs.*	.42
BYSC47G	Teacher morale is high.*	.42
BYSC47J	School day is structured for students.	.26
BYSC47L	School environment is flexible.*	.23
BYSC47O	Students face competition for grades.	.22
BYSC47K	Deviation from school rules not tolerated.	.19

NELS:88 Item	Description	Factor Loading
BYSC47B	Discipline is emphasized at this school.	.11
BYSC47D	Classroom is structured.	.06
BYSC47F	Students are expected to do homework.	-.11
BYSC47E	Teachers encourage students to do their best.	-.24

Note: * = reverse-coded (Speak of oblique rotation responsible for dual loadings. Factors are correlated at -.38.) Final coding: [1]0 = usually, 3 = never. [2]0 = most of the time, 3 = never. [3]0 = strongly agree, 3 = strongly disagree. [4]0 = not at all accurate, 4 = very much accurate. (Codes hold for all variables with same item number, unless reverse-coded, then the code is reversed.)

Appendix B

Description of Variables used in the Analyses

Outcome Variables

1. Math Achievement: BY2XMSTD, the standardized score on the mathematics test for 8th graders. Higher numbers reflect greater achievement. NCES reports a reliability coefficient of .89 for the mathematics items for eighth graders in the base year of the study (Rock & Pollack, 1995).

2. Academic Engagement: a standardized principal components factor weighted composite variable. See Appendix A for the factor loadings and individual items. Factor eigenvalue = 2.10. According to an examination of the scree plot, one factor was sufficient to adequately capture the variance in this item. Higher numbers reflect greater engagement in school. Coefficient alpha for this weighted component was .66.[1]

3. Locus of Control Orientation: BYLOCUS2, a standardized NELS-created composite of the following six locus of control items: BYS44B, BYS44C, BYS44F, BYS44G, BYS44K, BYS44M. BYS44K was reverse-coded. Higher numbers reflect greater internal locus of

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[1] Alpha was computed by the following formula for all of the weighted composites obtained from the principal component analysis (Mulaik, 1972):

$$\alpha = n/(n-1)\,[1 - (\Sigma\, V_I/V_t)]$$

In this case, due to standardization, $V_t = 1$ and $V_I = w^2$ where w = weight or standardized scoring coefficient obtained from the principal component analysis.

control orientation. Items include statements such as "When I make plans, I am almost certain I can make them work."

Student-Level Predictors

1. Gender: BYS12; recoded as a dummy variable in which females are coded 1; males are coded 0.

2. Minority Status: RACE; recoded as a dummy variable in which Whites and Asians are coded 0, and Blacks, Hispanics, and Native Americans are coded 1. Initially, Asian students were going to be analyzed separately, but many schools did not significantly vary with regard to the number of Asian students, causing 579 schools to be dropped from the analyses (versus 279 schools dropped due to insignificant variation in gender and other minority composition. These effects are probably due to the inclusion of private schools in NELS sampling procedures.). In addition, this variable had the lowest reliability of any of the other predictors, .069, and, more importantly, excluding this variable did not affect the analyses, nor were there any predictors for differentiation effects such as the Asian student gap in math achievement. Therefore, this variable was dropped from the analyses, in line with other researchers' treatment of race when using NELS data (Lee & Smith, 1993; Lee & Smith, 1995). Ultimately, because the relationship of school climate factors to inequitable relations between disadvantaged students' achievement and engagement in learning was of interest, grouping Black, Hispanic, and Native American students together makes sense. Asian students were coded 1 to reflect nonminority status regarding school effects.

3. SES: BYSES, a standardized NELS-created composite of the following parent questionnaire data: BYP30, BYP31, BYP34B, and BYP80—fathers' and mothers' income and education data. Higher numbers reflect greater socioeconomic status.

4. Prior Grades: BYGRADS, a NELS average of students' self-reports of their grades in English, mathematics, science, and social studies, with A = 4, B = 3, C = 2, D = 1, below D = .5. Higher numbers reflect better grades in previous years. This variable was standardized for use in the HLM analysis.

School-Level Predictors

1. Mean SES: BYSES was aggregated at the school level and then standardized as a proxy for school wealth. Higher numbers reflect greater economic advantage for a particular school.

2. Unresponsiveness: Students' perception of a cold, unresponsive school climate. Created from a principal components analysis of student questionnaire items that reflect a lack of warmth and responsiveness in teachers and the school environment. See Appendix A for factor loadings and individual item descriptors. Factor eigenvalue = 3.05. According to an examination of the scree plot, one factor was sufficient to adequately capture the variance in this set of items. Higher values indicate a less responsive school environment. Coefficient alpha for this weighted component was .78.

3. Rigor: Administrators' perception of a rigorous and demanding school environment. Created from a principal components analysis of administrator questionnaire items that reflect a structured school environment with high academic and behavioral expectations for students. Items were weighted with the principal components score to create the composite. See Appendix A for factor loadings and individual item descriptors. Higher values indicate a more rigorous school environment. According to an examination of the scree plot, two factors were sufficient to adequately capture the variance in the administrator responses to the school climate questions. Coefficient alpha for this weighted component was .82.

4. Conflictiveness: Administrators' perception of a negative and conflictive school environment. Conflictiveness is negatively correlated with Rigor, $r = -.38$. This composite, formed by weighting factor loadings with the principal components score, reflects a school climate consisting of negative teacher attitudes towards students, inability of teachers to motivate students, and conflict between teachers and administrators. See Appendix A for factor loadings and individual item descriptors. Higher values indicate a more conflictive school environment. Coefficient alpha for this weighted component was .58.

Appendix C

Hierarchical Models Used In Analysis

Fully Unconditional HLM Models

Level-1

$$Y_{ij} = B_{0j} + r_{ij}$$

Y_{ij} represents the score on the dependent variable for student *i* in school *j*. B_{0j} is the mean outcome for the j^{th} school and $r_{ij} \sim N(0, \sigma^2)$.

Level-2

$$B_{0j} = \gamma_{00} + u_{oj}$$

γ_{00} represents the grand mean outcome in the population and $u_{oj} \sim N(0, \tau_{00})$.

Within-School Models

Level-1

$$Y_{ij} = B_{0j} + B_{1j}(\text{GENDER}) + B_{2j}(\text{MINORITY}) + B_{3j}(\text{SES}) + B_{4j}$$

$$(\text{PRIOR GRADES}) + r_{ij}$$

Y_{ij} represents the score on the dependent variable for student *i* in school *j*, and, because all level-1 covariates were grand mean centered, B_{0j} represents the mean outcome, adjusted (or controlling) for differences among students due to gender, minority status, socioeconomic status, or prior grades. B_{1j}, B_{2j}, B_{3j}, and B_{4j} are the slopes of the relationships between each covariate and the outcome variable. r_{ij} is an error term whose variance now represents the residual variance among eighth graders after controlling for all four predictors.

Level-2

$$B_{0j} = \gamma_{00} + u_{oj}$$

$$B_{1j} = \gamma_{10} + u_{1j}$$

$$B_{2j} = \gamma_{20} + u_{2j}$$

$$B_{3j} = \gamma_{30} + u_{3j}$$

$$B_{4j} = \gamma_{40} + u_{4j}$$

At Level 2, each regression coefficient and intercept in the level-1 model was fit as randomly varying with no predictors except for an intercept. γ_{00} represents the grand mean of the outcome variable, adjusted for the covariates; γ_{10}—γ_{40} are the average slopes of the relationship between each covariate and the outcome variable. τ_{00} represents the variance among the school means for the outcome variable. τ_{11} - τ_{44} represent the variance in the school-specific slopes. The covariances associated with each pair of variances among the school means and slopes are reported in Table 4.

Between-School Models

Level-1 (same as the within-school model above)

Level-2

$$B_{0j} = \gamma_{00} + \gamma_{01}(\text{MeanSES}) + \gamma_{02}(\text{Unresponsive}) + \gamma_{03}(\text{Rigor}) + \gamma_{04}(\text{Conflict}) + u_{oj}$$

$$B_{1j} = \gamma_{10} + \gamma_{11}(\text{MeanSES}) + \gamma_{12}(\text{Unresponsive}) + \gamma_{13}(\text{Rigor}) + \gamma_{14}(\text{Conflict}) + u_{1j}$$

$$B_{2j} = \gamma_{20} + \gamma_{21}\,(\text{MeanSES}) + \gamma_{22}(\text{Unresponsive}) + \gamma_{23}(\text{Rigor}) + \gamma_{24}(\text{Conflict}) + u_{2j}$$

$$B_{3j} = \gamma_{30} + \gamma_{31}\,(\text{MeanSES}) + \gamma_{32}(\text{Unresponsive}) + \gamma_{33}(\text{Rigor}) + \gamma_{34}(\text{Conflict}) + u_{3j}$$

$$B_{4j} = \gamma_{40} + \gamma_{41}\,(\text{MeanSES}) + \gamma_{42}(\text{Unresponsive}) + \gamma_{43}(\text{Rigor}) + \gamma_{44}(\text{Conflict}) + u_{4j}$$

B_{0j} represents adjusted mean achievement; B_{1j} is the gender gap; B_{2j} is the minority gap; and B_{3j}, B_{4j}, and B_{5j} are the slopes of the relationship between locus of control, SES, and prior grades with achievement. These latter two relationships, B_{3j} and B_{4j}, are also considered the differentiating effects of social class and prior achievement on the outcomes of interest (Bryk & Raudenbush, 1992). γ_{00} represents the intercept of the relationship between the adjusted mean outcome and the Level-2 predictors, and γ_{10}-- γ_{40} represent the intercepts between the Level-1 slopes and the Level-2 predictors. These intercepts are not of substantive interest in the present study and thus are not interpreted in the body of the paper. What is of interest, however, are the slopes of the relationships between a Level-2 predictor and an adjusted mean outcome (γ_{01}—γ_{04}) controlling for the effects of the other Level-2 predictors, as well as the slope of the relationships between Level-1 slopes and the Level-2 predictors (γ_{11}—γ_{14}, γ_{21}—γ_{24}, γ_{31}—γ_{34}, γ_{41}—γ_{44}), also called the cross-level effects by Bryk and Raudenbush. All school-level and student-level predictors were grand mean centered.

Footnotes

[1] Although Phillips did include attendance rate as an outcome variable in her analysis, this variable is not a good proxy for student engagement in learning because other factors, such as illness, parental demands, and extracurricular activities could also be related to attendance.

[2] Weights in SAS were normalized according to the following formula:

Normalized weight = (Number of participants x NELS:88 weight) / Sum of weights

[3] Although the word effects is occasionally used for ease of grammatical presentation, this study does not support a causal interpretation of any of the relationships presented in this paper.

[4] Originally, BYS59C, "Rules for behavior are strict," was included in the analysis, but an examination of the factor pattern revealed that it was the only item that did not load on the Unresponsiveness component ($\lambda = -.01$), yet the Kaiser criterion and scree plot both supported a one component solution for this group of items. In addition, reliability for the component increased when this item was deleted. These results may have occurred because this item reflects more of an orientation toward rigor rather than negative, unresponsive schooling.

[5] Among other benefits, multilevel modeling provides robust standard errors when analyzing nested data (Bryk & Raudenbush, 1992).

[6] Other researchers using HLM have compared individual school means (see, for example, Battistich et al., 1995; Lee & Smith, 1993, 1995; Phillips, 1997), but this does not control for pre-existing differences between students; therefore we chose the approach of using the ANCOVA-based analysis.

[7] Comparing standardized HLM coefficients to effect sizes has become common practice among HLM researchers (e.g., Battistich et al., 1995; Lee & Smith, 1993, 1995).

[8] Unless otherwise stated, all tests of hypotheses were conducted at an $\alpha = .05$ level.

[9] Although recent research, (see, for example, Battistich et al., 1995; Phillips, 1997) centered the level-1 variables at the school mean, we chose to center them at the grand mean for two reasons. First, this approach makes the intercept interpretable as an adjusted mean and yields an ANCOVA-like analysis. Second, centering at the school mean does not control for pre-existing differences in students.

[10] This statistic is similar to a squared semi-partial correlation, or R^2 increase-type statistic.

Table 1

Descriptive Statistics for the Variables Used in the HLM Analyses

Variable	Mean	SD	Range
1. Student-Level Variables (N = 19435)			
Demographic/Within School Covariates			
Gender	.51	.49	(0, 1)
Minority Status	.22	.41	(0, 1)
SES	-.08	.76	(-2.97, 1.97)
Prior Grades	2.93	.75	(.50, 4.00)
Dependent Variables			
Math Achievement	50.85	10.00	(33.9, 77.2)
Academic Engagement	.00	1.00	(-4.75, 1.60)
Locus of Control	.03	.61	(-2.51, 1.45)
2. School-Level Predictors (N = 997)			
MeanSES	.00	1.00	(-2.98, 2.98)
Unresponsiveness	.00	1.00	(-3.06, 3.41)
Rigor	.00	1.00	(-6.20, 1.31)
Conflictiveness	.00	1.00	(-2.44, 3.69)

Note: Values are weighted with the appropriate weights with missing values removed. See Appendix B for further details and descriptions of the variables presented here.

Table 2

Correlations

1. Dependent Variables

	Locus of Control	Math Achvmt.	Academic Engmt.
Locus of Control	1.00	.28	.29
Math Achievement		1.00	.16

Note. N = 19,435.

2. Student-Level Covariates

	Gender	Minority	SES	Prior Grades
Gender	1.00	.03	-.04	.08
Minority		1.00	-.32	-.14
SES			1.00	.32

Note. N = 19,435.

3. School-Level Predictors

	MeanSES	Unresponsive	Rigorous	Conflictive
MeanSES	1.00	-.24	.11	-.31
Unresponsive		1.00	-.11	.27
Rigorous			1.00	-.32

Note. N = 997.

Table 3

Results from the Fully Unconditional HLM Model for Each Outcome

	Math Achievement	Engagement	LOC
Grand mean point estimate	.025	.045	.030
95% Confidence interval for the mean	(-.008, .057)	(.023, .067)	(.008, .051)
Variance within schools (σ^2)	.6615	.7678	.8184
Variance between schools (τ^2)	.2202	.0559	.0559
Proportion of total variability between schools	.25	.07	.06
Reliability	.75	.45	.44

Note. N = 997. Engagement = Academic Engagement. All outcome variables are standardized to a mean of 0 and standard deviation of 1.

Table 4

HLM Within-School Models for Student Outcome Measures

Dependent Variable	Mean	Independent Variables			
		Gender	Minority	SES	Prior Grades
Math Achievement	.00	-.13 (-.15)**	-.31 (-.35)**	.18**	.47**
Academic Engagmt	.03*	.17 (.18)**	.01 (.02)	-.01	.32**
Locus of Control	.03*	-.13 (-13)**	-.02 (-.02)	.10*	.31**

1. Math Achievement Correlations

Outcomes	1	2	3	4	5
1. Adjusted Mean	1.000	-.187	-.108	.273	.499
2. Gender Gap		1.000	-.304	-.016	-.139
3. Minority Gap			1.000	.366	-.026
4. SES-Ach Slope				1.000	-.112
5. Prior Grade-Ach Slope					1.000

2. Academic Engagement Correlations

Outcomes	1	2	3	4	5
1. Adjusted Mean	1.000	-.253	.010	.041	-.303
2. Gender Gap		1.000	-.345	-.020	-.056
3. Minority Gap			1.000	.200	.205
4. SES-Engmt. Slope				1.000	-.177
5. Prior Grade-Eng. Slope					1.000

3. Locus of Control (LOC) Orientation Correlations

Outcomes	1	2	3	4	5
1. Adjusted Mean	1.000	-.003	-.229	-.257	.074
2. Gender Gap		1.000	.003	-.122	-.145
3. Minority Gap			1.000	.578	-.172
4. SES-LOC Slope				1.000	-.348
5. Prior Grade-LOC Slope					1.000

Note. The numbers in parentheses are standardized using the pooled within standard deviations obtained from the HLM variance components estimates because of their categorical nature. All predictors were centered around their grand mean and were allowed to vary randomly in the model. Means are adjusted for differences among students with regard to gender, minority status, SES, and prior grades.

*$p < .05$. **$p < .001$.

Table 5

Standardized Regression Slopes for Between-School Models for Student Outcome Measures

	Predictors				
Dependent Variables	Intercept	MeanSES	Unresp	Rigor	Conflict
		1. Math Achievement			
Adj. Mean Achvmt.	-.01	.66***	.00	-.05	.05
Gender Gap	-.13***	-.09	.03	-.08	-.02
Minority Gap	-.28***	.05	-.15	.15	.17
SES-Achvmt. Slope	.15***	.18***	-.02	.08	.19**
Prior Grade-Ach. Slope	.47***	.59***	-.06	.05	.02
		2. Academic Engagement			
Adj. Mean Engmt.	.04***	-.03	-.65***	.04	.12*
Gender Gap	.17***	-.21**	.21**	.00	.00
Minority Gap	.03	.16*	-.03	.03	.11
SES-Engmt. Slope	-.01	-.05	-.07	.05	.17
Prior Grade-Eng. Slope	.31***	.04	.17*	-.07	.00
		3. Locus of Control (LOC) Orientation			
Adj. Mean LOC	.04***	.36***	-.49***	-.09	.13
Gender Gap	-.12***	.26***	.05	.04	.09
Minority Gap	.01	.03	.06	.13	.12
SES-LOC Slope	.08***	-.18*	.07	.15	.23**
Prior Grade-LOC Slope	.31***	.23**	-.05	-.08	.02

Note. N = 997. * p < .05; **p < .01; ***p < .001

Table 6

Adjusted School-Level Standard Deviations

	Math Achvmt	Academic Engagmt	LOC Orient.
SD Adjusted mean	.2846	.2085	.1560
SD Gender gap	.2373	.2776	.2679
SD Minority gap	.2168	.3553	.2672
SD SES slope	.1248	.1340	.1309
SD Prior Grades slope	.1443	.1586	.1465

N = 997.